REMARKS

This Preliminary Amendment is filed in order to facilitate processing of the above-identified application and responds to the Office Action dated February 22, 2006 in which the Examiner rejected claims 6-29 under 35 U.S.C. §103.

As indicated above, claim 11 has been amended to make explicit what is implicit in the claim. The amendment is unrelated to a statutory requirement for patentability. Claims 28 and 29 have been amended for dependency. The amendments are unrelated to a statutory requirement for patentability and do not narrow the literal scope of the claims.

Claim 11 claims an image pick-up device comprising a sensor, a pattern image, a calculation unit, a memory and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern that is a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor. The calculation unit detects shift amounts of center positions of colors against a center position of a standard color for every n pixels by using image data picked up from the pattern image and calculates chromatic aberration factors based on the detected shift amounts. The memory stores the calculated chromatic aberration factors. The correction unit corrects image data picked up from an original image based on the stored chromatic aberration factors.

Through the structure of the claimed invention having a calculation unit a) detect shift amounts of center position of colors against a center position of a standard color for every n pixels by using image data from the pattern image and b) calculate chromatic aberration factors based on the detected shift amounts, as

claimed in claim 11, the claimed invention provides an image pick-up device which can output stable color image information while not being influenced by chromatic aberrations. The prior art does not show, teach or suggest the invention as claimed in claim 11.

Claim 17 claims an image pick-up device comprising a sensor, a pattern image, a determining unit, a setting unit and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern that is a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor. The determining unit determines a character amount of the image data picked up from the pattern image. The setting unit sets chromatic aberration factors based on the character amount. The correction unit corrects image data picked up from an original image by using the chromatic aberration factors set by the setting unit.

Through the structure of the claimed invention having a) a determining unit determine a character amount of image data from a pattern image, b) a setting unit set chromatic aberration factors based on character amount and c) a correction unit correct image data based on the chromatic aberration factors, as claimed in claim 17, the claimed invention provides an image pick-up device which can output a stable color image information signal which is not influenced by chromatic aberration. The prior art does not show, teach or suggest the invention as claimed in claim 17.

Claims 6-29 were rejected under 35 U.S.C. §103 as being unpatentable over *Komiya et al.* (U.S. Patent No. 6,097,430) in view of *Kobayashi* (U.S. Patent No. 5,414,536).

Komiya et al appears to disclose an image processing apparatus for obtaining a broader-range photograph by photographing a subject image in a plurality of divided parts and joining or composing together part-images. (col. 1, lines 6-9) FIG. 15 shows an arrangement for calculating a correction values. The arrangement comprises a photographing camera 43 equivalent to that shown in FIG. 12, a sheet 47 for aberration detection which is placed on a stand bottom plate 46, a memory card 23 for recording image information on the sheet 47 for photographed aberration detection, a card reader 25 for reading out image information on the memory card 23, a data expanding section 30 for data-expanding the image information, an RGB converting section 31 for converting the information to RGB signals, an aberration correction value calculation section 48 for calculation correction values, a1, a2 corresponding to the focal length of header information and distortion aberration from lens position information, for aberration correction, and a distortion aberration correction table 27 for recording calculated correction values, a1, a2. In the image processing apparatus, the aberration detection sheet 47 is imaged by the photographing camera 43 and corresponding image information is stored in the memory card 23. The image information in the memory card 23 is read out of the card reader 25. After being data-expanded by the data-expanding section 30, the image information is converted to RGB signals by means of the RGB converting section 31. Then the signals are supplied to the aberration correction value calculating section 48 where correction values, a1, a2, are calculated. These correction values are written in the distortion aberration table 27 at those predetermined addresses determined by the focal length and lens position. It is

possible to perform compose processing with the use of the distortion aberration table 27 above. (Column 12, lines 5-33).

Thus, *Komiya et al.* merely discloses image information signals are supplied to an aberration correction value calculating section 48 where correction values are calculated (column 12, lines 20-33). However, nothing in *Komiya et al.* shows, teaches or suggests specifically how the chromatic aberration factors are calculated. In other words, nothing in *Komiya et al.* shows, teaches or suggests a calculation unit which detects shift amounts of center positions of colors against a center position of a standard color for every n pixels by using image data picked up from the pattern image and which calculates chromatic aberration factors based on the detected shift amounts as claimed in claim 11. Rather, *Komiya et al.* merely discloses calculating the correction values, but does not show, teach or suggest how they are calculated.

Furthermore, *Komiya et al.* only discloses calculating aberration correction values based upon image information stored in a memory card. Nothing in *Komiya et al.* shows, teaches or suggests a) a determining unit which determines a character amount of image data picked up from a pattern image, b) a setting unit which sets chromatic aberration factors based upon the character amount and c) a correction unit which corrects image data using the chromatic aberration factors as claimed in claim 17. Rather, *Komiya et al.* only discloses calculating correction values based upon image information stored in a memory card.

Kobayashi appears to disclose image readers of the type in which the image of an original text is formed on a linear image sensor by means of an optical imaging system (column 1, lines 9-12). An image reader, as shown in Fig. 1, reads an original

text 2 placed on a pattern 1 by projecting a slit-shaped light beam produced by illumination light source 3 onto the entire text surface continuously and focusing the reflected slit-shaped light beam from the text surface on a linear image sensor 5 by means of an optical imaging system 4, wherein the image reader further includes a position detection means 6 which detects the position of the image signal on the image sensor 5, by which the image signal is produced, along its scanning direction, an imaging performance setting means 8 which sets imaging performance information of the optical imaging system 4 for the image signal position detected by the position detection means 6, and decay correction means 9 which corrects the decay of image signal in accordance with the imaging performance information set by the imaging performance setting means 8. (Column 1, line 68 through column 2, line 17). An imaging performance assessment pattern 50 is placed along the field angle direction of the optical imaging system (scanning direction of image sensor shown by the arrow B in FIG. 3) in an portion of the platen 23 which is not used for the text 22. The imaging performance assessment pattern 50 used in this embodiment is a cyclic and alternate arrangement of a ladder pattern 51 of 41p (line pair)/mm parallel to the field angle direction of the optical imaging system and a ladder pattern 52 of 41p (line pair)/mm perpendicular to the field angle direction, as shown in FIG. 5 (column 4, lines 40-50). Fig. 7 shows an example of arrangement of the correction circuit 62 used in this embodiment. In the processing step of reading the imaging performance assessment pattern 50, the image signal of each color from the image sensor 40 is amplified by an amplifier 71, rid of noises by means of a sample-hold circuit 72, and converted into digital data by an A/D converter 73. The image data produced from the imaging performance assessment pattern 50 is then

processed by an imaging performance computation circuit 74, which calculates the modulation, for each color component, of the ladder pattern of the imaging performance assessment pattern 50, for example (refer to Japanese Patent Unexamined Publication No. 2-146571). The resulting imaging performance information for each position in the field angle direction of the optical imaging system is stored in a memory 75. In the processing step of reading image information of the text 22, the image signal of each color from the image sensor 40 is amplified by the amplifier 71, rid of noises by the sample-hold circuit 72, converted into digital data by the A/D converter 73, and fed to a decay correction circuit 76. The decay correction circuit 76 bases the image processing on a m-by-n digital filter, for example, which receives an operating factor from a factor generation circuit 77. In Fig. 8, indicated by 78 is a position calculation circuit which determines the position of image signal on the image sensor 40, and based on the positional information P provided by the circuit 78, imaging performance information k for that position is read out of the memory 75. The factor generation circuit 77 consists of a lookup table which contains a record of factors a_i (i=0, 1,..., k,..., n) of the decay correcting digital filter in correspondence to imaging performance information (i=0, 1,..., k,..., n) as address, and it delivers a piece of factor data a_k in response to the entry of a piece of imaging performance information as an address signal Adr-k. Consequently, the decay correction circuit 76 has its digital filter fact set accordingly. As a result, the image signal for each color component at each position of the image sensor 40 is corrected against decay based on the imaging performance information for that position during the passage through the decay correction circuit 76. (Column 5, lines 2-47).

Thus, *Kobayashi* merely discloses an image performance computation circuit 74 which calculates modulation for each color component of a ladder pattern. Nothing in *Kobayashi* shows, teaches or suggests a calculation unit which detects shift amounts of center positions of colors against a center position of a standard color for every n pixels by using image data picked up from the pattern image and which calculates chromatic aberration factors based on the detected shift amounts as claimed in claim 11. Rather, *Kobayashi* merely discloses an image performance computation circuit which calculates modulation for each color component of the ladder pattern.

Furthermore, *Kobayashi* merely discloses detecting the color component in order to calculate modulation. Nothing in *Kobayashi* shows, teaches or suggests a) a determining unit which determines a character amount, b) a setting unit which sets chromatic aberration factors based on the character amount and c) a correcting unit which corrects image data picked up from an original image using the chromatic aberration factor set by the setting unit as claimed in claim 17. Rather, *Kobayashi* merely discloses detecting color components, which are different from a character amount of an image data.

Since nothing in *Komiya et al.* or *Kobayashi* show, teach or suggest a) a calculation unit which detects shift amounts of center positions of colors against a center position of a standard color for every n pixels using image data picked up from the pattern image and which calculates chromatic aberration factors based on the detected shift amounts as claimed in claim 11, or b) a determining unit determining a character amount of image data from a pattern image, setting unit which sets chromatic aberration factors based on the character amount and a

correction unit which corrects image data picked up from an original image using the chromatic aberration factors as claimed in claim 17, Applicants respectfully request the Examiner withdraws the rejection to claims 11 and 17 under 35 U.S.C. §103.

Claims 12-13, 15-16, 18-21, 23 and 28-29 depend from claims 11 and 17 and recite additional features. Applicants respectfully submit that claims 12-13, 15-16, 18-21, 23 and 28-29 would not have been obvious within the meaning of 35 U.S.C. §103 at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 12-13, 15-16, 18-21, 23 and 28-29 under 35 U.S.C. §103.

New claim 30 has been added and recites additional features. Applicants respectfully submit that claim 30 is also in condition for allowance.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested. Should the Examiner find that the application is not now in condition for allowance, Applicants respectfully request the Examiner enters this amendment for purposes of appeal.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL PC

Date: May 17, 2006

By: _____
Ellen Marcie Emas
Registration No. 32,131

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620